

Over 28 years experience designing and deploying real-time software, hardware and embedded systems for the music technology and entertainment electronics industries, with a formal background in physics and engineering.

Career Highlights

- Designed hardware and software for milestone electronic musical instrument products, including the *Synclavier Digital Music System*, the *Linn9000* drum machine and the *360 Systems Pro MIDI Bass*.
- Developed theme park industry's first interactive digital audio system for roller coasters and ride-based attractions, now a standard feature in all new major Disney rides.
- Supervised show control systems installation for *Disneyland Paris* and *EPCOT Center*.
- Director of Walt Disney Imagineering R&D lab in Cambridge, MA. Disney corporate liaison to the MIT Media Lab.

Employment History

4/04-now: **Robertsonics**, Waltham, MA

Hardware/Software Engineering Consultant. Design, engineering and product development. Developed wireless USB products for recording studio environments. Designed, programmed and installed rugged and reliable interactive music exhibits for The Boston Children's Museum and the New York Hall of Science. Developed audio DSP hardware and algorithms for guitar effects – patent pending.

10/06-11/08: **iZotope, Inc**, Cambridge, MA

Director of Hardware and Embedded Development. Audio digital signal processing for embedded applications. Managed development of SHARC-based adaptive real-time noise reduction product for the professional broadcast markets. Developed audio algorithms for SHARC, Blackfin, SigmaDSP and several versions of TMS320Cx DSP devices. Detailed knowledge of VisualDSP, SigmaStudio and CodeComposer Studio.

10/92-4/04: **Walt Disney Imagineering R&D**, Glendale, CA

Principal Technical Staff – Director. Technology R&D for the Walt Disney Company. Designed (hardware and software) proprietary wavetable digital audio system for ride vehicles, now used in all new major Disney attractions. Designed and installed binaural digital audio system for *Aladdin's Magic Carpet* Virtual Reality Lab (EPCOT Center). Designed and programmed hand-held, location-sensitive photo capture device for park guests. Developed low-level PC plugins for internet radio venture (Go Radio). Created Win32 interactive music engine utilizing a context sensitive digital audio mixer and a multi-path MIDI sequencer. Developed PocketPC simulations of hand-held, IR-capable, promotional interactive TV devices (ESPN & Disney Interactive). Developed PC-based animation and audio control system. Designed electronic igniter for revolutionary air-launch fireworks system. Candle flicker controller patent awarded. Director of the Cambridge, MA R&D lab, with 6 researchers.

8/85-10/92: **Digital Ovations**, Burlington, VT

President, Principal Engineer. Engineering and R&D consulting group. Contract design, engineering and product development. Clients include:

Capital Cities/ABC, Inc: Developed a series of computerized studio rigging control systems for *World News Tonight*, *Good Morning America* and *All My Children* studios.

Universal Studios Florida: Lead control systems engineer for extensive redesign and installation of the *Earthquake!* attraction ride control system.

Disneyland Paris: Supervised on-site installation, test and adjust for *Tomorrowland* attractions. Provided park-wide support for hardware and software troubleshooting.

Also: **360 Systems, Voyetra Technologies, Linn Electronics (Roger Linn)**

8/82-8/85: **New England Digital Corporation**, White River Jct, VT
Project Engineer – Hardware R&D Coordinator. Hardware design for the *Synclavier* Digital Music System. Projects include 76-note weighted velocity and pressure sensitive keyboard and programmable digital oscillator for 32-voice sampling system.

6/80-8/82: **Walt Disney Imagineering**, Glendale, CA
Electronics Engineer, Sr. Developed and installed park-wide monitoring and control systems for EPCOT Center and Tokyo Disneyland. Designed hardware and developed software for a portable animation system for *Audio Animatronic™* figure programming.

6/79-12/79: **RCA/David Sarnoff Research Center**, Princeton, NJ
Microsystems Engineer. Patent applied for adaptive stepper motor controller.

Expertise

Programming: C/C++ (Visual C++, Embedded Visual C++, VisualDSP). Assembler (StrongARM, SigmaDSP, Microchip Pic, Cypress encore, PSoC and wireless USB, 80X86, 80196, 80C31/51, 680X0). PLC (Allen Bradley, Siemens, AutomationDirect, Koyo).
Win32, COM, DirectShow, WinSock, low-level Windows multimedia, MIDI Processing.

Hardware: Embedded systems (Intel, Microchip, Cypress, Motorola), Digital audio (A/D, D/A, wavetable synthesis, AES-EBU), Audio DSP (Analog Devices, TI), Communication interfaces (USB, wireless USB, IR, RS-485), Packaging and PC board layout and fab.

Creative: Digital music production. Write, perform and engineer original compositions. Accomplished musician - released two music CDs in Fall 2007, available on iTunes & CD Baby. Superb knowledge of MIDI and audio recording, processing and mastering software and hardware. Excellent artist empathy skills.

Applications: Media development tools (Sonar, WaveLab, Sony SoundForge, Adobe Audition, Sony Vegas, Ableton Live, MotionBuilder, 3D Studio MAX, PhotoShop, CorelDraw,).

Education

1976-1980 University of Maine at Orono, Orono, ME
Degree: **B.S. Engineering Physics**, with Highest Honors & Highest Distinction
Major: Physics Minor: Electrical Engineering

Awards: Holmes Award (Outstanding Senior in Physics)
Hovey Award (Outstanding Senior in Science & Engineering)